

CLAIMS

1. An optical film in which a polarizing plate and plural retardation films are laminated so that an absorption axis of the polarizing plate is perpendicular or parallel to slow axes of the plural retardation films and the slow axes of the plural retardation films are parallel to one another, wherein

an N_z value expressed by $N_z = (n_{x1} - n_{z1}) / (n_{x1} - n_{y1})$ is in the range of from 0.15 to 0.85 and

an in-plane retardation Re_1 expressed by $Re_1 = (n_{x1} - n_{y1}) \times d_1$ is in the range of from 200 to 350 nm,

where in each of the plural retardation films, a direction along with the refractive index in the film plane is maximum is defined as the X-axis, a direction perpendicular to the X-axis as the Y-axis, the thickness direction of the film as the Z-axis, and where refractive indices in each axial direction are defined as n_{x1} , n_{y1} , and n_{z1} , respectively, and the thickness of the film as d_1 (nm).

2. The optical film according to claim 1, wherein a retardation film (a) and a retardation film (b) are laminated in this order from the polarizing plate side, and the absorption axis of the polarizing plate is parallel to the slow axes of the two retardation films,

the retardation film (a) has an N_z value in the range of from 0.65 to 0.85, and

the retardation film (b) has an N_z value in the range of from 0.15 to 0.35.

3. The optical film according to claim 1, wherein a retardation film (b) and a retardation film (a) are laminated in this

order from the polarizing plate side, and the absorption axis of the polarizing plate is perpendicular to the slow axes of the two retardation films,

the retardation film (a) has an Nz value in the range of from
5 0.65 to 0.85, and

the retardation film (b) has an Nz value in the range of from
0.15 to 0.35.

4. The optical film according to claim 2 or 3, wherein the
10 absolute value of a difference in Nz value between the retardation
film (a) and the retardation film (b) is in the range of from 0.4 to
0.6.

5. The optical film according to any one of claims 1 to 4,
15 wherein the optical film is a laminate in which the plural
retardation films are laminated on one side of the polarizing plate
obtained by laminating a transparent protective film on both sides
of a polarizer so that the absorption axis of the polarizing plate is
perpendicular or parallel to the slow axes of the plural retardation
20 film and the slow axes of the plural retardation films are parallel to
one another.

6. The optical film according to Claim 5, wherein the
transparent protective film laminated on at least one side of the
25 polarizing plate comprises a thermoplastic resin (A) having a
substituted and/or non-substituted imide group in a side chain and
a thermoplastic resin (B) having substituted and/or
non-substituted phenyl group, and nitrile group in a side chain.

7. The optical film according to Claim 5 or 6, wherein
30

an in-plane retardation expressed by $Re_2 = (n_{x2} - n_{y2}) \times d_2$ is 20 nm or less, and

a thickness direction retardation expressed by $R_{th} = \{(n_{x2} + n_{y2}) / 2 - n_{z2}\} \times d_2$ is 30 nm or less,

5 where in the transparent protective film laminated on at least one side of the polarizing plate, a direction along with the refractive index in the film plane is maximum is defined as the X-axis, a direction perpendicular to the X-axis as the Y-axis, the thickness direction of the film as the Z-axis, and where refractive
10 indices in each axial direction are defined as n_{x2} , n_{y2} , and n_{z2} , respectively, and the thickness of the film as d_2 (nm).

8. The optical film according to any one of Claims 5 to 7,
15 wherein the transparent protective film is a film that is treated by stretching process.

9. A image viewing display comprising, the optical film
according to any one of Claims 1 to 8.

20 10. A liquid crystal display in IPS mode,
wherein the optical film according to any one of Claims 1 to 8 is arranged on a cell substrate on a viewing side,

a polarizing plate comprising a transparent protective film
laminated on both sides of a polarizer is arranged on a cell
25 substrate opposite to the viewing side, and

an extraordinary refractive index direction of a liquid
crystalline substance in a liquid crystal cell and an absorption axis
of the polarizing plate are parallel, in a state where voltage is not
applied.

**11. A liquid crystal display in IPS mode,
wherein a polarizing plate comprising a transparent
protective film laminated on both sides of a polarizer is arranged
on a cell substrate on a viewing side,**

**5 the optical film according to any one of Claims 1 to 8 is
arranged on a cell substrate opposite to the viewing side, and
an extraordinary refractive index direction of a liquid
crystalline substance in a liquid crystal cell and an absorption axis
of the optical film are perpendicular, in a state where voltage is not
10 applied.**

**12. The liquid crystal display according to Claim 10 or 11,
wherein the transparent protective film laminated on at least one
side of the polarizing plate comprises a thermoplastic resin (A)
15 having a substituted and/or non-substituted imide group in a side
chain and a thermoplastic resin (B) having a substituted and/or
non-substituted phenyl group, and a nitrile group in a side chain.**

**13. The liquid crystal display according to any one of Claims
20 10 to 12, wherein**

**an in-plane retardation expressed by $Re_2 = (n_{x2} - n_{y2}) \times d_2$ is
20 nm or less, and**

**a thickness direction retardation expressed by $R_{th} = \{(n_{x2} +$
 $n_{y2}) / 2 - n_{z2}\} \times d_2$ is 30 nm or less,**

**25 where in the transparent protective film laminated on at
least one side of the polarizing plate, a direction along with the
refractive index in the film plane is maximum is defined as the
X-axis, a direction perpendicular to the X-axis as the Y-axis, the
thickness direction of the film as the Z-axis, and where refractive
30 indices in each axial direction are defined as n_{x2} , n_{y2} , and n_{z2} ,**

respectively, and the thickness of the film as d_2 (nm).

**14. The liquid crystal display according to any one of
Claims 10 to 13, wherein the transparent protective film is a film
5 that is treated by stretching process.**